No. 8800151

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Asgrow Seed Company

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S), AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'A5403'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D. C. *this* 28th *day of* February *in the year of our Lord one thousand nine hundred and* eighty-nine.

Attest:

Kenneth A. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Clayton Yeutter
Secretary of Agriculture

APPROVAL EXPIRES 2-28-89

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)
Asgrow Seed Company

2. TEMPORARY DESIGNATION
XP5304

3. VARIETY NAME
A5403

4. ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*
9626-190-29
Kalamazoo, MI 49001

5. PHONE *(Include area code)*
(616) 385-6608

FOR OFFICIAL USE ONLY
PVPO NUMBER
8800151

6. GENUS AND SPECIES NAME
Glycine max

7. FAMILY NAME *(Botanical)*
Leguminosae

FILING
DATE
May 16, 1988
TIME
9:30 ☑ A.M. ☐ P.M.

8. KIND NAME
Soybean

9. DATE OF DETERMINATION
March 1984

FEES RECEIVED
AMOUNT FOR FILING
$ 1800 00
DATE
May 16 1988
AMOUNT FOR CERTIFICATE
$ 200 00
DATE
Dec. 7, 1988

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Delaware

12. DATE OF INCORPORATION
March 22, 1968

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
John E. Cross
9626-190-29
Asgrow Seed Company
Kalamazoo, MI 49001
PHONE *(Include area code)*: (616) 385-6608

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED
- a. ☒ Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- b. ☒ Exhibit B, Novelty Statement.
- c. ☒ Exhibit C, Objective Description of Variety *(Request form from Plant Variety Protection Office.)*
- d. ☒ Exhibit D, Additional Description of Variety.
- e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act.)* ☐ Yes *(If "Yes," answer items 16 and 17 below)* ☒ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ Yes ☐ No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☐ Foundation ☐ Registered ☐ Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ Yes *(If "Yes," give date)*
☒ No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES ?
☐ Yes *(If "Yes," give names of countries and dates)*
☒ No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT [signature] DATE May 2nd 1988

SIGNATURE OF APPLICANT DATE

FORM LS-470 (3-86) *Edition of 7-84 obsolete.*

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EXHIBIT A

8800151

ORIGIN AND BREEDING HISTORY OF A5403

1981 — CROSS WAS MADE IN THE FIELD AT QUEENSTOWN, MARYLAND.

PARENTS: X5421*A5474
X5421 = ESSEX*K1017

1981-82 (WINTER) — F1 GENERATION WAS GROWN AT ISABELA, PUERTO RICO.

1982 — F2 GENERATION WAS GROWN AT ISABELA, PUERTO RICO.

1982-83 (WINTER) — F3 PLANTS WERE GROWN AND SCREENED TO SOYBEAN CYST NEMATODE IN THE GREENHOUSE AT MARION, ARKANSAS. RESISTANT PLANTS WERE TRANSPLANTED AND F4 SEED WAS HARVESTED.

1983 — PROGENY ROW E81419-QC83-004A WAS SELECTED AT QUEENSTOWN, MARYLAND FOR ITS STANDABILITY AND GOOD AGRONOMIC APPEARANCE.

1983-84 (WINTER) — F5 SEED WAS SENT TO ISABELA, PUERTO RICO TO OBTAIN ENOUGH SEED FOR YIELD TESTING IN 1984. In March 1984 line E81419-QC83-004A was determined to be stable and unique.

1984 — E81419-QC83-004A WAS ENTERED IN THE preliminary P511 YIELD TEST CONDUCTED AT QUEENSTOWN, MARYLAND AND SELBYVILLE, DELAWARE. IT PRODUCED UNIFORM STANDS AND VERY HIGH YIELDS.

1985 — E81419-QC83-004A WAS ENTERED IN THE STRAIN S502 YIELD TEST WHICH WAS GROWN AT 8 LOCATIONS IN MARYLAND, VIRGINIA, NORTH CAROLINA, KENTUCKY, ARKANSAS, TENNESSEE AND MISSISSIPPI. IT WAS SELECTED FOR ITS HIGH YIELD AND STANDABILITY.
E81419-QC83-004A WAS ASSIGNED THE MATURITY DESIGNATION X5304.

1986 — X5304 WAS ENTERED IN THE VARIETY V501 TEST AND THE STRAIN S502 TEST WHICH WERE GROWN AT 18 LOCATIONS IN MARYLAND, VIRGINIA, NORTH CAROLINA, KENTUCKY, ARKANSAS, ALABAMA AND MISSISSIPPI. IT WAS SELECTED FOR ITS HIGH YIELD, STANDABILITY AND DISEASE TOLERANCE.
X5304 WAS NOMINATED FOR PILOT PRODUCTION AND ASSIGNED THE MATURITY DESIGNATION XP5304. SIXTY POUNDS OF BREEDER SEED WERE PRODUCED AT QUEENSTOWN, MARYLAND. THIS BREEDER SEED WAS SENT TO ISABELA, PUERTO RICO FOR INCREASE.

1987 — XP5304 WAS ENTERED IN THE VARIETY V501, VARIETY V550, STRAIN S502, STRAIN S503 AND STRAIN S551 YIELD TESTS WHICH WERE GROWN AT 41 LOCATIONS IN MARYLAND, VIRGINIA, NORTH CAROLINA, INDIANA, KENTUCKY, ARKANSAS, MISSOURI, MISSISSIPPI AND TENNESSEE. IT WAS SELECTED FOR ITS HIGH YIELD, STANDABILITY AGRONOMIC APPEARANCE AND DISEASE TOLERANCE.
XP5304 WAS ASSIGNED THE MATURITY DESIGNATION A5403. ONE HUNDRED POUNDS OF BREEDER SEED WERE PRODUCED AT QUEENSTOWN, MARYLAND AND MARION, ARKANSAS. SIX THOUSAND UNITS OF BASIC SEED WERE PRODUCED AT MATTHEWS, MISSOURI

- continued on Page 2-

EXHIBIT A (con't)

Trial evaluations since 1984 indicate A5403 is uniform and stable. As with other soybean varieties, variants can occur for almost any characteristic during the course of repeated sexual reproduction.

Asgrow Seed Company
PVP Application Soybean A5403
April 1988

8800151

EXHIBIT B

NOVELTY STATEMENT CONCERNING A5403 SOYBEANS

TO OUR KNOWLEDGE, THE SOYBEAN VARIETIES THAT MOST CLOSELY RESEMBLE A5403 ARE ESSEX, STAFFORD AND YORK. CHARACTERISTICS WHICH DIFFERENTIATE A5403 INCLUDE, BUT ARE NOT NECESSARILY RESTRICTED TO, THE FOLLOWING:

1. SOYBEAN CYST NEMATODE REACTION - RACES 3 AND 4

A5403	=	RESISTANT
ESSEX	=	SUSCEPTIBLE
STAFFORD	=	SUSCEPTIBLE
YORK	=	SUSCEPTIBLE

FORM APPROVED: OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN & SEED DIVISION
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Soybean)

OBJECTIVE DESCRIPTION OF VARIETY
SOYBEAN (Glycine max L.)

NAME OF APPLICANT(S)	TEMPORARY DESIGNATION	VARIETY NAME
Asgrow Seed Company	XP5304	A5403

ADDRESS *(Street and No., or R.F.D. No., City, State, and Zip Code)*
9626-190-29

Kalamazoo, MI 49001

FOR OFFICIAL USE ONLY
PVPO NUMBER
8800151

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g., [0][9]). Starred characters ★ are considered fundamental to an adequate soybean variety description. Other characters should be described when information is available.

1. SEED SHAPE:

[1]

1 = Spherical (L/W, L/T, and T/W ratios = < 1.2)
2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio = < 1.2)
3 = Elongate (L/T ratio > 1.2; T/W = < 1.2)
4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

★ **2. SEED COAT COLOR: (Mature Seed)**

[1] 1 = Yellow 2 = Green 3 = Brown 4 = Black 5 = Other *(Specify)* _____

3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

[1] 1 = Dull ('Corsoy 79'; 'Braxton') 2 = Shiny ('Nebsoy'; 'Gasoy 17')

★ **4. SEED SIZE: (Mature Seed)**

[1][5] Grams per 100 seeds

★ **5. HILUM COLOR: (Mature Seed)**

[5] 1 = Buff 2 = Yellow 3 = Brown 4 = Gray 5 = Imperfect Black 6 = Black 7 = Other *(Specify)* _____

★ **6. COTYLEDON COLOR: (Mature Seed)**

[1] 1 = Yellow 2 = Green

★ **7. SEED PROTEIN PEROXIDASE ACTIVITY:**

[1] 1 = Low 2 = High

★ **8. SEED PROTEIN ELECTROPHORETIC BAND:**

[ ] 1 = Type A ($SP1^a$) 2 = Type B ($SP1^b$)

★ **9. HYPOCOTYL COLOR:**

[3] 1 = Green only ('Evans'; 'Davis') 2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')
3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')
4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

★ **10. LEAFLET SHAPE:**

[3] 1 = Lanceolate 2 = Oval 3 = Ovate 4 = Other *(Specify)* _____

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11. LEAFLET SIZE:

[2] 1 = Small ('Amsoy 71'; 'A5312') 2 = Medium ('Corsoy 79'; 'Gasoy 17') 3 = Large ('Crawford'; 'Tracy')

12. LEAF COLOR:

[2] 1 = Light Green ('Weber'; 'York') 2 = Medium Green ('Corsoy 79'; 'Braxton') 3 = Dark Green ('Gnome'; 'Tracy')

★ **13. FLOWER COLOR:**

[2] 1 = White 2 = Purple 3 = White with purple throat

★ **14. POD COLOR:**

[1] 1 = Tan 2 = Brown 3 = Black

★ **15. PLANT PUBESCENCE COLOR:**

[1] 1 = Gray 2 = Brown (Tawny)

16. PLANT TYPES:

[2] 1 = Slender ('Essex'; 'Amsoy 71') 2 = Intermediate ('Amcor'; 'Braxton') 3 = Bushy ('Gnome'; 'Govan')

★ **17. PLANT HABIT:**

[1] 1 = Determinate ('Gnome'; 'Braxton') 2 = Semi-Determinate ('Will') 3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

★ **18. MATURITY GROUP:**

[0][8] 1 = 000 2 = 00 3 = 0 4 = I 5 = II 6 = III 7 = IV 8 = V 9 = VI 10 = VII 11 = VIII 12 = IX 13 = X

★ **19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)**

BACTERIAL DISEASES:

★ [0] Bacterial Pustule *(Xanthomonas phaseoli* var. *sojensis)*

★ [0] Bacterial Blight *(Pseudomonas glycinea)*

★ [0] Wildfire *(Pseudomonas tabaci)*

FUNGAL DISEASES:

★ [0] Brown Spot *(Septoria glycines)*

Frogeye Leaf Spot *(Cercospora sojina)*

★ [0] Race 1 [0] Race 2 [0] Race 3 [0] Race 4 [0] Race 5 [ ] Other *(Specify)* _____

[0] Target Spot *(Corynespora cassiicola)*

[0] Downy Mildew *(Peronospora trifoliorum* var. *manshurica)*

[0] Powdery Mildew *(Microsphaera diffusa)*

★ [0] Brown Stem Rot *(Cephalosporium gregatum)*

[0] Stem Canker *(Diaporthe phaseolorum* var. *caulivora)*

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19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

FUNGAL DISEASES: (Continued)

★ [0] Pod and Stem Blight *(Diaporthe phaseolorum* var; *sojae)*

[0] Purple Seed Stain *(Cercospora kikuchii)*

[0] Rhizoctonia Root Rot *(Rhizoctonia solani)*

Phytophthora Rot *(Phytophthora megasperma* var. *sojae)*

★ [1] Race 1 [1] Race 2 [1] Race 3 [1] Race 4 [1] Race 5 [1] Race 6 [1] Race 7

[1] Race 8 [1] Race 9 [1] Other *(Specify)* Races 10 - 24

VIRAL DISEASES:

[0] Bud Blight (Tobacco Ringspot Virus)

[0] Yellow Mosaic (Bean Yellow Mosaic Virus)

★ [0] Cowpea Mosaic (Cowpea Chlorotic Virus)

[0] Pod Mottle (Bean Pod Mottle Virus)

★ [0] Seed Mottle (Soybean Mosaic Virus)

NEMATODE DISEASES:

Soybean Cyst Nematode *(Heterodera glycines)*

★ [0] Race 1 [0] Race 2 [2] Race 3 [2] Race 4 [ ] Other *(Specify)* _____

[0] Lance Nematode *(Hoplolaimus Colombus)*

★ [1] Southern Root Knot Nematode *(Meloidogyne incognita)*

★ [0] Northern Root Knot Nematode *(Meloidogyne Hapla)*

[1] Peanut Root Knot Nematode *(Meloidogyne arenaria)*

[0] Reniform Nematode *(Rotylenchulus reniformis)*

[ ] OTHER DISEASE NOT ON FORM *(Specify):* _____

20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

★ [0] Iron Chlorosis on Calcareous Soil

[ ] Other *(Specify)* _____

21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

[0] Mexican Bean Beetle *(Epilachna varivestis)*

[0] Potato Leaf Hopper *(Empoasca fabae)*

[ ] Other *(Specify)* _____

22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape	Essex	Seed Coat Luster	Essex
Leaf Shape	Essex	Seed Size	A5474
Leaf Color	Essex	Seed Shape	A5474
Leaf Size	Essex	Seedling Pigmentation	Essex

23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

VARIETY	NO. OF DAYS MATURITY	PLANT LODGING SCORE	CM PLANT HEIGHT	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS	NO. SEEDS/ POD
				CM Width	CM Length	% Protein	% Oil		
A5403 Submitted	137	2.3	84			43.7	21.3	15.4	
Essex Name of Similar Variety	133	3.3	69			45.2	21.2	13.2	

PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-A_2 in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.

Asgrow Seed Company
PVP Application Soybean A5403
April 1988

8800151

EXHIBIT D

ADDITIONAL DESCRIPTION OF VARIETY

A5403 IS OF SIMILAR MATURITY TO A5474.

A5403 HAS PURPLE FLOWER COLOR, GRAY PUBESCENCE COLOR, TAN POD WALL COLOR AND SEED WITH IMPERFECT BLACK HILA COLOR, DULL SEED COAT LUSTER AND LOW PEROXIDASE ACTIVITY.

A5403 HAS AN EXCELLENT HYPOCOTYL EMERGENCE SCORE AND HAS TESTED RESISTANT TO SOYBEAN CYST NEMATODE RACES 3 AND 4.

8800151

Asgrow Seed Company
PVP Application Soybean A5403
April 1988

A5403 is an early Maturity Group IV cultivar which combines a consistently high yield potential with resistance to races 3 and 4 of the soybean cyst nematode. It also combines good standability, excellent emergence and tolerance to many leaf and stem diseases with this increased yield potential to provide farmers the first early group IV cultivar with SCN resistance.

Asgrow Seed Company
PVP Application Soybean A5403
April 1988

EXHIBIT E

STATEMENT OF THE BASIS OF APPLICANT'S OWNERSHIP

A5403 was originated and developed by William K. Rhodes, an Asgrow Plant Breeder. By agreement between employee and Asgrow Seed Company, all rights to any invention, discovery, or development made by an employee are assigned to the Company. No rights to such invention, discovery, or development are retained by the employee.